Water Resources & Renewable Energy Development in Asia
Danang, 10-11 March 2008

VIETNAM COUNTRY UPDATE & HYDRO POWER DEVELOPMENT PLAN

Dr. Lam Du Son; MOB EVN
National Network - Interconnection Network
Power Plants Construction in the South
NPP - Projects Investment Abroad
1. Current Situation of Power Electricity
2. Power Development Plan until 2025
3. Vietnam Power Market
4. Generation Power Development Plan
5. Hydropower Development Plan
CURRENT SITUATION
**GENERATION & CONSUMPTION**

**2007**

**GENERATION 66,860 TWh**

**SALES 58,434 TWh**

**INSTALLED 13,138 MW**

**PEAK 11,500 MW**

**L/F 66%**
SALES GROWING 13.87 %
AVERAGE in 10 year 15%

CUSTOMER 10 mil
LOSS 10.8%
**HYDRO**
4,487MW; 36.57%

**COAL**
1,630MW; 13.28%

**GAS & OIL**
3,462; 28.2%

**OTHERS**
832MW; 6.78%

**EVN = 77.8%**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>NUMBER Of PPs</th>
<th>CAPACITY (MW)</th>
<th>% TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDRO</td>
<td>14</td>
<td>4,801</td>
<td>36.54</td>
</tr>
<tr>
<td>COAL</td>
<td>7</td>
<td>1,730</td>
<td>13.17</td>
</tr>
<tr>
<td>GAS</td>
<td>5</td>
<td>5,200</td>
<td>39.58</td>
</tr>
<tr>
<td>OIL</td>
<td>3</td>
<td>575</td>
<td>4.38</td>
</tr>
<tr>
<td>OTHERS</td>
<td>NA</td>
<td>832</td>
<td>6.33</td>
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<tr>
<td>TOTAL</td>
<td>27</td>
<td>13,138</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**IPP&BOT = 22.22%**

**OIL & GAS**
5,321MW; 43.37%

**EVN**

**100.00**
### RURAL ELECTRIFICATION (12/2007)

<table>
<thead>
<tr>
<th>Level</th>
<th>Coverage Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Province</td>
<td>100%</td>
</tr>
<tr>
<td>District</td>
<td>100%</td>
</tr>
<tr>
<td>Village</td>
<td>96.5%</td>
</tr>
<tr>
<td>Rural HHs</td>
<td>92.8%</td>
</tr>
</tbody>
</table>

**Transmission & Distribution**

- **500 KV**
  - Total length: 5,650 km
  - Total power: 15,923 MVA

- **220 KV**
  - Total length: 11,053 km
  - Total power: 20,656 MVA

- **110 KV**
  - Total length: 116,660 km
  - Total power: 3662 MVA

- **220V**
  - Total length: 109,000 km
  - Total power: 32,061 MVA

**Key Metrics**

- 116,660 km TG: 3662 MVA
- 109,000 km 32,061 MVA
- 6KV (3.9%)
- 10KV (16%)
- 15KV (22%)
- 22KV (31.9%)
- 35KV (28.1%)
POWER DEVELOPMENT PLAN

UNTIL 2025
## POWER DEVELOPMENT PLAN VI

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SALES (TWh)</strong></td>
<td>58,434</td>
<td>96,200</td>
<td>210,000</td>
<td>340,000</td>
<td>450,000</td>
</tr>
<tr>
<td><strong>GENERATION (TWh)</strong></td>
<td>66,860</td>
<td>105,800</td>
<td>227,000</td>
<td>363,000</td>
<td>484,000</td>
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<tr>
<td><strong>PEAK (MW)</strong></td>
<td>11,500</td>
<td>18,000</td>
<td>38,000</td>
<td>60,000</td>
<td>79,000</td>
</tr>
<tr>
<td><strong>CAPACITY (MW)</strong></td>
<td>13,138</td>
<td>25,700</td>
<td>50,000</td>
<td>78,000</td>
<td>100,000</td>
</tr>
<tr>
<td><strong>500 KV</strong></td>
<td>3,286</td>
<td>4,823</td>
<td>7,115</td>
<td>9,779</td>
<td>11,989</td>
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<tr>
<td></td>
<td>6,600</td>
<td>14,100</td>
<td>25,500</td>
<td>41,400</td>
<td>56,250</td>
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<tr>
<td><strong>220 KV</strong></td>
<td>5,650</td>
<td>11,484</td>
<td>15,138</td>
<td>17,442</td>
<td>19,033</td>
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<tr>
<td></td>
<td>15,932</td>
<td>32,818</td>
<td>57,191</td>
<td>90,066</td>
<td>126,127</td>
</tr>
<tr>
<td><strong>110 KV</strong></td>
<td>11,053</td>
<td>19,188</td>
<td>22,949</td>
<td>25,949</td>
<td>28,449</td>
</tr>
<tr>
<td></td>
<td>20,656</td>
<td>41,271</td>
<td>65,707</td>
<td>105,680</td>
<td>146,106</td>
</tr>
</tbody>
</table>
500kV GRID in DIFFERENT PERIODS (2003 - 2020)

- Current 500kV line
- 2006 - 2010
- After 2010

After 2010

Current 500kV line
POTENTIAL PROJECTS UNDER CONSIDERATION

with CAMBODIA:
- Chau Doc–Phnom Penh: 230kV; 90km; 2008
- Tan Dinh – Sambor: 230kV; 150km; 2019

with LAO PDR:
- Ban Mai – Nam Mo (105MW): 230kV; 85km; 2012
- Ha Tinh – Nam Theun 2: 500kV; 160km; 2015 – Exchange with Thailand
- Pleiku – Ban Sok: 500kV; 180km; 2012
- 1,600MW exchanged in 2020

with YUNNAN:
- Soc Son – Malutang (400MW): 230/500kV; 250km; 2019
- Maybe earlier!

(SOURCE: Norconsult International AS)
VIETNAM POWER MARKET
STRUCTURE OF EVN before 2005

EVN Headquarter

National Load Dispatching Center

- 17 Power Plants
- 4 Power Transmission Companies
- 7 Power Distribution Companies
- Electric Telecomunication Company
- 7 Hydropower Project MBs
- 2 Thermal Power Project MBs
- 3 Power Network Project MBs
- Admin & Tele Center Project MB

- Institute Of Energy
- 4 Power Engineering Consulting Co.
- 2 Electro-Machinery Companies

- Information Technology Center
- Public Center
- Electrical College
- 3 Electrical Training Schools
GROUP AFTER REFORM

Mother Company

- National Load Dispatching Center
- Hoa Binh; Ialy; Tri An HPP
- Generation Project MBs
- Electricity Institute
- 2 Electrical Colleges
- Public Center
- Electrical University
- Electrical Vocational School

TPP: Thermal Power Plant
HPP: Hydro Power Plants

Subsidiaries

Power Transmission Company

Current Ltd Co.
- Can Tho TPP*
- Phu My TPP
- Thu Duc TPP
- Hai Duong PDC
- Ninh Binh PDC
- Da Nang PDC

Future Ltd Co.
- EVN Tel
- Hanoi PDC
- HCMC PDC
- Dongnai PDC
- Haiphong PDC

PDC: Provincial Distribution Co
ADC: Area Distribution Co

Join Stock Co.

E VN > 50%

Current JSCs
- VS-SH HPP
- Thac Ba HPP
- Pha Lai TPP
- Hai Phong TPP
- Quang Ninh TPP
- Khanh Hoa DC Equipment Co
- Mechanical Co
- 4 PECCs
- EVN Cambodia

Future JSCs
- DN-HT-DM HPP
- Thac Mo HPP
- Uong Bi TPP
- Ninh Binh TPP
- Ba Ria TPP
- IT Center Mechanical Co.
- PC1 ADC
- PC2 ADC
- PC3 ADC
- Generation JSCs
- Finance JSCs

E VN < 50%

Sesan 3A HPP
Electricity Development Co.
IQ Links Ltd Co
An Binh Bank
Central HPP
Viet – Lao HPP Co.
DEVELOPMENT OF POWER GENERATION